The Impact of Trade on the Political, Military, and Economic Cooperation between States

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Abstract

This paper examines the relationship between trade and political, military, and economic cooperation using a model in which trade and cooperation are simultaneously determined. We use events data for the period 1990-2004 to test the reciprocal effects of trade and cooperation for different types and lower levels of conflict. We find that trade has a statistically significant but very small positive effect on political and economic cooperation but does not raise military cooperation. The factors affecting military conflict are very different than those affecting political and economic cooperation. We show that cooperation between dyads has a much larger and more robust impact on trade than trade has on cooperation in all specifications of the model. One novel result is that a country has larger trade flows if its neighboring countries are more cooperative with each other.

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1. INTRODUCTION

When the Clinton administration discussed "the contribution open trade can make to prosperity, peace, and the rule of law,"[1] and the Bush administration suggested that "free trade brings nations closer,"[2] they are drawing arguments from the liberal paradigm contending that trade promotes cooperation and peace. John Stuart Mill endorsed this argument in the middle of the 1800s when he included the promotion of peaceful relations as one of the 'intellectual and moral' effects of trade (Irwin 2005). The topic has become increasingly significant in recent years, given the policy implications of globalization. The foreign policy impact of trade influenced the vote in the House of Representatives over the North American Free Trade Agreement, for example, where 59 House members stated that they were supporting NAFTA in part because it would improve foreign relations with Mexico (Baldwin and Magee 2000).

Recent empirical studies, coinciding with the democratic peace debate, have yielded much insight about the effect of trade on military conflict. Yet, the results concerning the direction between trade and conflict have been inconsistent. Does trade lead to peace or does peace lead to trade? Many papers, such as Oneal and Russett (1997), find that increased trade flows reduce the likelihood of militarized interstate disputes. Other studies, such as Barbieri (2002), however, find a positive relationship between trade and conflict.[3] Keshk, Pollins, and Reuveny (2004) use a simultaneous equation model to show that conflict significantly affects trade, but trade has no significant impact on conflict. While militarized interstate disputes have been extensively studied, recent reviews of work in the field have suggested that we should complement research on military disputes with data that reflect both cooperation and conflict (Mansfield & Pevehouse 2003; Reuveny 2003). Furthermore, several studies have argued that a narrow focus on only one type of conflict (military) may miss important relationships between

trade and other forms of cooperation between nations. This paper adopts a broader perspective on cooperation than is typical most existing studies and we extend the literature by examining how trade and lesser forms of conflict or cooperation are related.

There are several competing paradigms when it comes to the expected relationship between trade and lower forms of conflict. The logic of the liberal paradigm suggests that we should observe greater cooperation between states that have high levels of economic interaction. Realists and dependency theorists, on the other hand, envision trade to be directed by politics and argue that trade does not necessarily lead to peace. Finally, the crisis and bargaining literature implies that it is possible for economically linked states to have greater conflict (short of war) as a way to communicate private information and signal one's commitment.

This paper tests these theories by estimating the relationship between trade and three categories of cooperation: political, military, and economic. While many researchers have examined the relationship between trade and military conflict, this study extends the analysis to consider specifically political and economic interactions and to compare the impact of trade on different types of cooperation.[4] These cooperation measures are drawn from an events data set covering the period 1990-2004. The events data include not only overt military disputes but also more subtle degrees of cooperation and conflict such as promising military, economic, or policy support and threatening the use of force. In order to examine the relationship between trade and cooperation, we develop a simultaneous-equation model that allows trade to influence cooperation and cooperation to affect trade.

Our results suggest that there is a very strong effect of cooperation on trade, lending support to earlier studies finding that political climate influences trade. An increase in cooperation generally leads to large increases in bilateral trade flows, and this result is robust to

changes in the specification of the model. The impact of trade on cooperation, on the other hand, is estimated to be much smaller and is less robust to changes in the specification of the model. Higher trade flows lead to statistically significant increases in political and economic cooperation, but trade does not improve military cooperation between countries. Furthermore, the estimated effect of trade on each type of cooperation tends to be small in magnitude so that even large increases in trade lead to relatively small gains in cooperation. Thus, while the estimates provide some evidence in favor of the liberal paradigm, the support is not overwhelming. Trade provides a small boost to political and economic cooperation between countries, but it does not necessarily enhance military cooperation in the short run.

2. TRADE AND CONFLICT

The liberal paradigm, based on the works of Angell (1910) and Kant ([1795] 1957), argues that increased trade between states reduces conflict. The strongest empirical support for this paradigm is provided by the work of Russett and his colleagues (Russett and Oneal 2001; Oneal, Russett, and Berbaum 2003). The logic behind the liberal proposition is illustrated by the rational model, which argues that highly connected states are deterred from initiating conflict because they risk losing the benefits of their economic interactions. Polachek (1980) argues that the fear of economic or social welfare losses deters conflict. Gartzke and Li (2003) show that global integration reduces the attractiveness of using force because global markets supply necessary information and signaling capabilities, providing states more options to pursue their goals peacefully, and thus reducing the need to resort to force. Rosecrance (1986) makes a similar argument that economic links replace military force as a way for states to obtain what they need. Increased economic activity among states may also lead to better communication,

trust, and institutions. One likely outcome of such a process is a community marked by greater integration (Deutsch et al. 1957).

Realists and radical (dependency) theorists have challenged the liberal paradigm by questioning the theoretical foundation of the model and arguing that trade can be a source of conflict among countries.[5] Neorealists argue that states are concerned with how relative gains are likely to affect security and power consideration of states, since gains from trade are not likely to be the same for both states (Waltz 1979). The fear is that relative gains from trade can lead to a military advantage.[6] Thus, political considerations should influence trade relations. The findings by Barbieri (1996, 2002), Pollins (1989), and Keshk , Pollins, and Reuveny (2004) suggest a positive relationship between trade and conflict. Furthermore, the effect of trade on interstate relations is contingent on a host of other intervening variables. Gowa (1994), for example, has argued that the effect of trade on conflict depends on other factors, including alliances and the structure of the international system. Dependency theorists also highlight the negative consequences of trade, particularly when the relationship is asymmetrical. Studies such as Wallensteen (1973) and Barbieri (1996) have suggested that asymmetrical trade is associated with conflict. Asymmetrical trade can result in net costs, particularly for the weaker state. Increases in economic activity and trade during the seventeenth and eighteenth centuries, for example, had the effect of increasing rivalries and conflict, as Holsti (1991) argues.

These studies surveyed here have been important in illuminating the relationship between trade and conflict, but the literature in recent years has been rather narrowly focused on a severe level of conflict involving the threat or use of force that can be found in the Militarized Interstate Dispute (MID) data set. More recently, some scholars have argued that more emphasis should be placed on the link between trade and different forms (or lower levels) of conflict such as trade

disputes, sanctions, and threats of force (Schneider, Barbieri, and Gleditsch 2003; Mansfield and Pollins 2003). If the liberal paradigm is right, economic interdependence should do more than prevent militarized disputes: it should promote cooperation in many different areas. This paper takes such arguments seriously and examines the relationship between interdependence and different forms of cooperation and conflict.

3. EMPIRICAL MODEL

The liberal paradigm provides a theoretical explanation for why trade reduces military conflict: increased bilateral trade ties raise the costs of engaging in a war since the mutual gains from trade may be lost or reduced. Higher levels of trade may also result in better trust and communications between countries. Each of these arguments suggest that trade will lead to increased cooperation in political and economic matters. Political or economic conflict, for example, might lead to protectionist policies, which would threaten the gains from trade in the same way that military conflict could. The potential costs of political or economic conflict, then, rise with higher levels of bilateral trade. Thus, the theory behind the liberal paradigm also predicts that trade will increase political and economic as well as military cooperation.

The relationship between trade and political or economic cooperation is likely to differ from that between trade and military cooperation, however, for several reasons. First, military disputes might disrupt trade flows more than other forms of conflict. Second, strategic behavior may alter the relationship between trade and cooperation. Gartzke (2003) argues that if economically linked states are not likely to go to war because the costs would be prohibitive, and national leaders know this, then such knowledge can lead states to take greater risks and increase low intensity conflicts. Dorussen and Hegre (2003) develop a multi-country model to assess the

impact of trade on conflict and argue that if the conflict is limited and states expect trade to continue afterwards, trade might make countries more aggressive. Russett (2003: 164) states "We may reasonably expect trade to reduce military conflict, but not necessarily all manifestations of conflict short of violence."

Formal models of crisis bargaining such as Morrow (1999) and Gartzke, Li, and Boehmer (2001) suggest that higher levels of trade provide actors more options for signaling their resolve or private information in a crisis. Morrow (1999) argues that actions such as trade sanctions or other measures can be viewed as costly signals of resolve. Such signaling helps both actors to diminish the ambiguity surrounding their intentions because they have a greater range of options to choose from, making it possible to arrive at a settlement short of war. Thus, states do not have to resort to war as the only way to reveal private information (Wagner 2000). The implication of the crisis bargaining literature is that higher levels of trade can increase lower-level political, economic, and military conflict.

In estimating the impact of trade on cooperation, it is imperative to do so within a simultaneous equation framework in which cooperation is also allowed to affect trade. The logic of the liberal paradigm, in fact, is based on the assumption that conflict would reduce trade between countries. A number of papers have found that conflict reduces trade. Reuveny and Kang (1998) show, using Granger causality tests, that trade both affects and is influenced by conflict. Morrow, Siverson and Tabares (1998) show that political relations between states affect levels of trade, and Pollins (1989) finds that the level of trade varies depending on the political climate in a dyad. Anderton and Carter (2003) show that trade declines significantly during most long wars and declines in half of the shorter wars. Despite the evidence that conflict

reduces trade, until recently most papers examining the impact of trade on conflict have done so with a single-equation framework, which assumes that conflict has no impact on trade.

In our model, we test the impact of trade on cooperation and the effect of cooperation on trade simultaneously, as several previous works have done (Reuveny and Kang 1996; Reuveny 2001; Polachek 1980 and 1997; Keshk, Pollins, and Reuveny 2004). With mutual causation between trade and cooperation, the ordinary least squares regressions estimated by many of the early studies in the field do not provide consistent estimates of how the explanatory variable affects the dependent variable. We develop two equations in which both trade and cooperation are treated as endogenous. The model is estimated by two-stage least squares (2SLS).

Cooperation Equation

Equation (1) shows the determinants of the cooperation level shown by source country i to target country j, $cooperation_{ijt}$.

$$\begin{aligned} Cooperation_{ijt} &= \beta_0 + \beta_1 ln(trade_{ijt}) + \beta_2 (regional\ cooperation_{it}) + \beta_3 (regional\ cooperation_{jt}) \\ &+ \beta_4 ln(GDP_{it}) + \beta_5 ln(GDP_{jt}) + \beta_6 ln(GDPPC_{it}) + \beta_7 ln(GDPPC_{jt}) + \beta_8 ln(distance_{ij}) \\ &+ \beta_9 contiguous_{ij} + \beta_{10} language_{ij} + \beta_{11} colony_{ij} + \beta_{12} RTA_{ijt} + \beta_{13} (polity_{it} + polity_{jt}) \\ &+ \beta_{14} | polity_{it} - polity_{jt} | + \beta_{15} IGO_{ijt} + \beta_{16} allied_{ijt} + \beta_{17} capability\ ratio_{ijt} + \sum \alpha_t D_t + \varepsilon_{ijt} \end{aligned} \quad (1)$$

In equation 1, $trade_{ijt}$ is exports from country i to j in time t. Thus, β_1 measures the effect of bilateral trade on cooperation (there is no change in the results if source country imports are used instead). The coefficients β_2 and β_3 measure the effect of neighborhood or regional cooperation levels on the cooperation level between i and j. The variables D_t are dummy variables for each year, and they control for changes over time in the typical cooperation levels between all countries.

Equation 1 includes several control variables that can influence cooperation between states. Goertz and Diehl (1992) and Siverson and Starr (1991) have suggested that neighboring states have more reasons to engage in conflict over territory, natural resources, and issues relating to nationalism. We include the log of distance and a contiguity dummy variable to capture these effects. We do not attempt to investigate how different types of borders and the ease of interaction across them affects international cooperation as Starr and Thomas (2005) do. The interaction of states is also expected to be influenced by historical and cultural links, and it is likely that states that speak the same language and have a common colonial history will exhibit greater cooperation. Democratic states rarely go to war with each other, as many studies such as Dixon (1994) and Maoz and Russett (1993) have shown. Given the close link between open trade, peace, and democracies, controlling for the effect of government types is important.

The role of relative power or asymmetry of power is critical to the realist approach in understanding conflict. The major debate is about the effect of the balance of power: whether power preponderance or equality of power provides for greater stability in the international system (Blainey 1988). Alliances are also an important element in the realist approach to interstate conflict. Allies have fewer reasons to go to war against each other due to common interests and security concerns. Moreover, ties between allies and trading partners tend to be stronger (Gowa 1994).

Membership in regional trade agreements (RTAs) has been linked to cooperation. Mansfield (2003) finds that non-RTA members are one-third to one-half more likely to be engaged in a dispute than are members of RTAs. Common membership in intergovernmental organizations is also expected to reduce the probability that a pair of countries will be in conflict (Russett, Oneal, and Davis 1998).

Balch-Lindsay and Enterline (2000) have found that countries in unstable regions have longer civil wars. It is possible that there are similar "neighborhood effects" in international relations so that nations in relatively peaceful regions may have greater cooperation with other countries. In order to test this hypothesis, we include a regional cooperation variable that measures the average level of cooperation between a country's ten nearest neighbors (based on geographic distance). This variable measures the stability or level of conflict in a given region.

Trade Equation

In order to estimate the effect of cooperation on trade, we adopt the gravity model of trade flows. There is a large literature showing that the gravity model can be derived theoretically from Ricardian, Heckscher-Ohlin, and increasing returns to scale frameworks. Evenett and Keller (2002) summarize this literature and argue (p. 282) that "the gravity equation constitutes … one of the most important results about trade flows." Frankel and Rose (2002: 440) similarly claim that the gravity framework "is one of the more successful empirical models in economics." In the simplest form of the gravity model, the natural log of trade is assumed to depend on the GDP levels of the country pair and the bilateral distance between them. Other control variables are commonly added, such as GDP per capita, contiguity, common languages, colonial ties, landlocked countries, and preferential trade agreements. To this basic framework, we add measures of bilateral cooperation and the regional cooperation between each country's neighbors. These variables allow us to estimate the impact of cooperation on trade after controlling for the standard determinants of trading patterns.

We also include several other control variables that have been found to influence trade. First, Martin and Velazquez (2002) include transportation infrastructure as a determinant of trade

flows. To measure country infrastructure, we include variables measuring kilometers of railways, inland waterways, highways, and the number of airports per square km of land area. Membership in the World Trade Organization can be expected to enhance trade flows by reducing trade barriers and giving countries preferential access to other WTO members' markets. We include dummy variables indicating whether each country is a member of the WTO in year t. Finally, Mansfield, Milner, and Rosendorff (2000) show that pairs of democracies have greater levels of trade than do mixed pairs of countries (one democracy and one autocracy). Thus, we include several polity variables in the trade equation as well.

$$\begin{aligned} ln(trade_{ijt}) = {} & \delta_0 + \delta_1 cooperation_{ijt} + \delta_2 regional\,cooperation_{it} + \delta_3 regional\,cooperation_{jt} + \\ & \delta_4 ln(GDP_{it}) + \delta_5 ln(GDP_{jt}) + \delta_6 ln(GDPPC_{it}) + \delta_7 ln(GDPPC_{jt}) + \delta_8 ln(\text{distance}_{ijt}) + \\ & \delta_9 contig_{ijt} + \delta_{10} language_{ijt} + \delta_{11} colony_{ijt} + \delta_{12} RTA_{ijt} + \delta_{13}(polity_{it} + polity_{jt}) + \\ & \delta_{14} \mid polity_{it} - polity_{jt} \mid + \delta_{15} railways_{it} + \delta_{16} railways_{jt} + \delta_{17} highways_{it} + \delta_{18} highways_{jt} + \\ & \delta_{19} airports_{it} + \delta_{20} airports_{jt} + \delta_{21} waterways_{it} + \delta_{22} waterways_{jt} + \delta_{23} landlock_{it} + \\ & \delta_{24} landlock_{jt} + \delta_{25} WTO_{it} + \delta_{26} WTO_{jt} + \sum \gamma_t D_t + u_{ijt} \end{aligned} \tag{2}$$

The key coefficient of interest in equation (2) is δ_1, the effect of bilateral cooperation on trade flows. Our hypothesis is that greater cooperation leads to higher levels of trade because importers and exporters can feel more confident that their fixed investments in trade will not be lost due to rising trade barriers or other results of interstate conflict. It is possible in theory for trade to be reduced by cooperation if military or humanitarian aid acts as a substitute for trade in goods. If cooperation does replace trade in any meaningful way, then we could observe $\delta_1 < 0$ since the coefficient on cooperation in equation (2) is not restricted to be positive.

Equations (1) and (2) can be estimated separately by ordinary least squares (OLS), but these estimates suffer from endogeneity bias when trade and cooperation each influence the other. We estimate equations (1) and (2) by two-stage least squares (2SLS), which provides consistent estimates of the parameters when the causality runs both ways. In order to estimate

the system of equations, there need to be independent variables included in the cooperation equation but excluded from the trade equation. These instrumental variables allow the effect of cooperation on trade to be estimated. The instrumental variables in the trade equation but excluded from the cooperation equation allow the effect of trade on cooperation to be estimated. The choice of instruments is particularly important since invalid or weak instruments can lead to inconsistent estimates, and the consequences can be worse than ignoring the endogeneity of each variable and estimating equations (1) and (2) separately by ordinary least squares. Staiger and Stock (1997), for example, discuss how 2SLS estimates perform poorly in tests when the F-statistic on the instrumental variables in the first stage regression is less than 10. The estimates presented in section 5 show that the instruments used in this paper are very strong and easily pass the tests for weak instruments. With such strong instruments, estimating equations (1) and (2) simultaneously by 2SLS provides consistent estimates of the effect of trade on cooperation and the effect of cooperation on trade.

The instruments included in the cooperation equation are the number of IGOs the two countries share in common, a dummy variable for a common alliance, and the capabilities ratio of the two countries. Each of these variables should affect the cooperation between the two countries but not directly influence bilateral trade flows. Some researchers have argued that an alliance and the capabilities ratio might affect trade flows. In theory, for example, an alliance might improve cooperation between a pair of countries and thus raise trade. Notice, however, that once the cooperation level between the two countries is controlled for, an alliance should have no additional impact on trade. In the data, adding the alliance variable to the trade equation reveals that an alliance does not increase trade once the cooperation level is accounted for (the coefficient on the alliance variable is actually negative). If the capabilities ratio is added to the

trade equation, it has no significant impact on trade. Dropping each instrument individually or dropping both the alliance and capabilities ratio variables from the cooperation equation does not change the key conclusion below that cooperation significantly raises trade flows.

There is a larger set of instruments included in the trade equation (2). This equation includes the four infrastructure variables (railways, highways, waterways, and airports relative to country size), WTO membership dummy variables, and dummy variables for landlocked countries. Each of these variables can reasonably be expected to influence trade but should have no impact (except indirectly through changes in trade flows) on country cooperation levels. Country GDP and GDPPC levels, distance, contiguity, common languages, colonial ties, regional trade agreements, and regional cooperation levels are included in both equations (1) and (2).

4. DATA

Most of the empirical studies on the subject of trade and conflict have used the Militarized Interstate Disputes (MID) data set, which contains episodes in which states threaten, display or use force. While studies using the MID data set have yielded significant insights into the connection between economic interdependence and military conflict, low level disputes that do not result in military action are missed. Reuveny (2003) calls on researchers to return to the use of events data, and Pevehouse (2003) also suggests that events data might be a better way to operationalize conflict.

Events data provide many advantages: greater flexibility; a more accurate accounting of states' conflictive and cooperative behavior; and a better ability to examine subcategories of conflict and cooperation. The details that events data provide are critical if we are to examine the effect of trade on all interactions between states.[7] Events data use a net conflict or

cooperation score to indicate the overall state of relations between two states by aggregating these scores over specific periods of time.

The conflict and cooperation measures used in this paper are constructed from a machine coded international events data set developed by Virtual Research Associates Inc. (VRA).[8] The VRA Reader uses the lead sentence from Reuters news reports to classify events from 1990 to 2004 into one of 157 possible event type codes called the Integrated Data for Events Analysis (IDEA). The IDEA framework provides more detailed interaction of states than can be found in the World Event/Interaction Survey (WEIS) and can be mapped onto Goldstein's (1992) conflict-cooperation scale, in which negative values represent acts of conflict and positive values indicate cooperation. King and Lowe (2003) provide an evaluation of the VRA data set and a mapping of IDEA codes to Goldstein's conflict-cooperation scale. The use of this relatively new events data set provides another contribution of this paper to the existing literature.

The data set contains 630,497 international dyadic events for the period 1990-2004 that can be mapped onto the Goldstein conflict-cooperation scale. The rich and detailed nature of the IDEA codes confidently allows us to classify each type of event into one of three categories: political, military, and economic.[9] Political events relate to government actors and diplomacy. The military category includes armed groups, weapons, and military or violent actions. Economic events are largely policy changes on economic issues such as extending or reducing aid and easing or threatening economic sanctions. Reports about trade flows are not included in the measures of cooperation. Appendix 1 contains a full list of events in each category and the associated Goldstein scores.

For annual measures of dyadic cooperation, we follow Reuveny and Kang (1998) in summing the Goldstein scores over all events within a year to create a net cooperation variable

between countries i and j in year t: $cooperation_{ijt} = \sum_{year\ t\ events} (cooperation_{ij} + conflict_{ij})$. Since Goldstein scores for cooperative events are positive and scores for conflictual events are negative, a positive value for the cooperation variable indicates there is net cooperation within the dyad while a negative value indicates there is net conflict. The net cooperation-conflict score is zero for dyads if no events were reported between them during the year. The key results below are unchanged if the analysis is limited to only observations with at least one dyadic event reported in the data set. We create four different cooperation measures – one for all events, and one each for political, economic, and military events. The Goldstein scores for each event weight the events by how conflictual or how cooperative each event is. A military assault receives a score of -10, for example, while asking for military aid receives a score of 1.6. Thus, our net cooperation measure is a weighted sum of the events. The Goldstsein scores in each category provide a preliminary indication that military relationships between nations are determined by fundamentally different factors than are political and economic relationships. While political and economic cooperation scores are significantly positively correlated with each other, the military cooperation score actually has a slightly negative correlation with both political and economic cooperation.

Real trade flows are measured in millions of 2000 dollars, and the trade data are from the IMF Direction of Trade Statistics Database. In cases for which country A does not report a value of imports from country B, we follow Gleditsch (2002) in replacing the missing observation with the reported exports from B to A or with zero when no bilateral trade flows are reported by either country.

Distance, contiguity, language, and colonial variables are from the French Research Center in International Economics: http://www.cepii.fr/anglaisgraph/bdd/distances.htm (CEPII).

Distance is defined as the great circle distance in km between the countries' most important cities. States are defined as contiguous if they share a common land border. Real GDP is measured in billions of 2000 dollars and real GDP per capita in 2000 dollars. Both variables are from the Penn World Table version 6.2 (Heston, Summers, and Aten, 2006).

Scores for regime types are obtained from the Polity IV data set, where $polity_{it}$ is the net polity score (democracy – autocracy) for country i in time t and ranges from 10 for pure democracies to -10 for pure autocracies. We include two variables measuring the government types of the country pair. One is the sum of the two polity scores, $polity_{it} + polity_{jt}$, which measures how democratic the pair is overall. Combining the polity scores into one variable assumes that source and target country polity values have the same impact on cooperation, but it allows us also to measure the effect on cooperation of how different the two countries' regime types are: $| polity_{it} - polity_{jt} |$.

To measure the capability of states, we rely on the military capability index developed by the Correlates of War (COW) project. The index incorporates dimensions of population, economic, and military power (Singer and Small, 1995). Following Oneal and Russett (1999), the capability ratio is defined as the natural logarithm of the ratio of the stronger state capability index over the weaker member in each dyad.

Data on membership in regional trade agreements are from wto.org and CEPII. Data on countries' involvement in 341 international governmental organizations (IGOs) are taken from the COW data set. Based on this data set, we created a variable measuring the number of IGOs that each pair of countries shared in common in a particular year. We use the COW data set on formal alliances, defined as mutual defense pacts, neutrality agreements and ententes. A list of all variables with their sources and definitions can be found in Table 1. Several of the control

variables were not available after 2000 (alliances and IGO membership) or 2001 (the capabilities ratio). These are unlikely to change significantly in only a few years, so we used the most recently available value for each dyad for the 2001-2004 observations. The key results below are unchanged if the analysis is limited to the 1990-2000 period.

5. RESULTS

Tables 2 and 3 present the results of estimating equations (1) and (2) by two-stage least squares. The first columns present the results using the measure of overall cooperation between countries based on all the dyadic events reported and then the following three columns use the political, military, and economic cooperation measures. Each of the models in Table 2 have low R^2 values, indicating that the dyadic cooperation measures, particularly on military matters, are difficult to predict using the explanatory variables. A low R^2 does not, however, provide evidence against a model. As Goldberger (1991, p. 177) describes, the purpose of a regression is to estimate the parameters in the population and the goodness of fit in the sample (R^2) is not relevant to the population parameters. The last rows in Tables 2 and 3 provide F-statistics testing the joint significance of the instrumental variables in each regression. As the tables show, the instrumental variables are highly significant as a group in each equation, and always well above the level (F=10) below which 2SLS suffer from weak instrument bias according to Staiger and Stock (1997).

The estimates in Table 2 show that trade has a statistically significant impact on overall cooperation levels between countries but the magnitude of the effect is small. The coefficient indicates that doubling bilateral trade raises overall cooperation by 0.1 points, or about 0.008 standard deviations. Higher levels of trade flows are also found to raise economic and political

cooperation between countries in a statistically significant but small manner. Trade flows are not found to raise military cooperation (in fact, the coefficient is significantly negative). Thus, there is some support for the liberal view that trade raises cooperation, but it does not extend to every form of cooperation and there is no evidence that trade improves cooperation on military matters.

The estimated impact of trade on cooperation is also not very robust to changing the instruments included in the trade equation but excluded from the cooperation equation. To test the robustness of the effect of trade on cooperation, we estimated equation (1) by 2SLS using 62 different combinations of instruments for the trade variable. The average coefficient on the trade variable was 0.10, slightly smaller than when all of the instruments are used in Table 2. In 40 of the regressions (65%), trade was found to have a statistically significant (at the 5% level) positive impact on cooperation. All of the coefficients on the trade variable were small in magnitude, however. Among all 62 regressions, the largest estimated impact of trade on cooperation implied that doubling bilateral trade would raise cooperation by 0.6 units, or less than 0.05 standard deviations.

Many researchers have pointed out the need to include lagged dependent variables to address the possibility of temporal dependence since dyads with histories of conflict are more likely to be at war in the current period as well (Beck, Katz, and Tucker 1998; Oneal, Russett, and Berbaum 2003; Keshk, Pollins, and Reuveny 2004). In one final robustness check, we added a lagged dependent variable into the cooperation equations when they were estimated. When the lagged cooperation measure is included as an explanatory variable, the trade coefficient is not statistically significant in any of the four regressions in Table 2. None of the conclusions from Tables 3, 4, or 5 are changed by adding in the lagged dependent variables to the model.

Table 2 shows that greater cooperation between a country's ten nearest neighboring countries (measured by the regional cooperation variable) does not enhance a country's own levels of bilateral cooperation, either overall or on political or economic issues – the coefficients on the regional cooperation variables are actually negative. There is a significant and positive coefficient on one of the regional cooperation variables in the military cooperation equation. That result would be consistent with the hypothesis that there is more military cooperation (or less conflict) between a pair of countries if they reside in peaceful regions of the world. The fact that there is only one significant positive coefficient out of eight possible on the regional cooperation variables, however, means that the evidence for this hypothesis is very weak.

Political and economic cooperation levels are significantly higher between countries with large economies, that share a common land border, colonial history, and language, and that are members of an alliance. A large disparity in economic and military power between the countries, measured by the capability ratio, tends to reduce the levels of economic and political cooperation between nations but has a positive effect on military cooperation.

Many of these results do not extend to military cooperation, however. Countries with large economies show less military cooperation, for example. Sharing a land border, despite raising political and economic cooperation, reduces cooperation on military matters, a finding that is consistent with previous studies on this subject. Surprisingly, sharing a common language and colonial heritage and being in an alliance also reduce military cooperation once all the other variables are controlled for, a result that is consistent with the findings in Oneal, Russett, and Berbaum (2003).

Countries that are different in their political systems (measured by the absolute difference in their polity scores) have significantly less overall and military cooperation but do not have less

cooperation on economic issues. Sharing many IGOs in common also raises political and military cooperation but has no significant impact on nations' economic cooperation, suggesting that members of an IGO will not always agree on economic policies. Overall, Table 2 reveals that the relationships between cooperation and many variables (including trade) depend critically on the type of cooperation being examined. Military cooperation in particular appears to be quite different from the other forms of cooperation studied here, which suggests that the results of studies on military cooperation or conflict should not be automatically generalized as applicable to other types of cooperation.

Comparing the determinants of different types of cooperation reveals several interesting results. First, proximity between nations sparks military tension but enhances political and economic cooperation. The estimates reveal that contiguous and nearby countries cooperate more politically and economically but have more military conflict than do countries that are farther apart. The results also show that autocracies and democracies do not cooperate well with each other. Interestingly, though, a pair of autocracies actually cooperates more politically than does a pair of democracies. Finally, a preponderance of power (measured by the national capabilities index) by one member of a dyad inhibits military conflict but it leads to less political and economic cooperation between the countries.

Table 3 shows the impact of cooperation on trade, with political, economic, and overall cooperation significantly raising trade flows, while the impact of military cooperation is insignificant. A one unit rise in cooperation increases trade flows by 13%. Not surprisingly, economic cooperation has the largest impact on trade flows. That result makes intuitive sense – the impact of cooperation over economic matters (such as trade sanctions) on trade should be greater than the impact of political cooperation (such as humanitarian support).

While the pattern of statistical significance is similar in Tables 2 and 3, the impact of cooperation on trade is estimated to be much larger in magnitude than the effect of trade on cooperation. A rise of one standard deviation in the log of trade increases overall cooperation by only 0.044 standard deviations. An increase of one standard deviation in cooperation, on the other hand, raises the log of trade by 0.41 standard deviations, so the effect of cooperation on trade is nearly ten times larger than the effect of trade on cooperation. Using standard deviation changes in this comparison is necessary because it adjusts for the fact that the two variables have different distributions.

As in Table 2, altering the instruments used to identify the system of equations does not change the basic conclusion in the vast majority of cases. Estimating the trade equation by 2SLS using all seven possible combinations of the three instruments reveals that cooperation significantly raises trade at the 1% level in six of them (86%). Only when both the number of common IGOs and the alliance variables are dropped from the system (leaving only the capability ratio to identify the effect of cooperation on trade) does cooperation not significantly raise trade. For the other six regressions, however, the estimated impact of cooperation on trade is comparable in magnitude to that in Table 3.

Interestingly, higher cooperation between a country's regional neighbors enhances trade flows, as the significant positive coefficient on seven of the eight regional cooperation coefficients reveals. This result means that, even after controlling for bilateral cooperation levels, countries that are in more cooperative regions tend to have greater trade. Germany's trade with every other country in the world, for example, is estimated to be enhanced by the high cooperation of its neighbors, while Egypt's trade with other countries is depressed by the poor cooperation among Egypt's neighboring countries. The coefficients in the first column of Table

3 indicate, in fact, that Egypt's exports would be 39% higher and its imports would be 17% higher if Egypt's neighbors were as cooperative as the world average. One explanation for this result is that countries in conflict-prone regions may be seen as risky trading partners. While the United States has very high levels of cooperation with Egypt, for example, the poor cooperation among Egypt's neighbors may signal to traders that Egypt could be drawn into regional conflict, and this perception could have a depressing effect on trade flows. Another possible explanation is that (particularly for landlocked countries) international trade flows often pass through adjacent countries, and thus the stability and good relations among a country's neighbors affects its own volume of trade. The result that greater cooperation between a country's regional neighbors increases trade is remarkably robust. It appears in OLS regressions as well as 2SLS, and it emerges whether regional cooperation is measured using the 5, 10, or 15 closest neighbors to a country.

The other coefficient estimates in Table 3 are reasonable and are similar to those estimated by other researchers using the gravity model. Countries with large and rich economies (measured by GDP and GDP per capita) trade more, as do countries in close proximity and those that share a common land border, language, or colonial ties. Regional trade agreements are estimated to increase trade flows by between 78% and 87%. Being a member of the WTO raises a country's exports by 30-46% and raises imports by 14-22%. Landlocked countries have 39-45% lower exports and 66-71% smaller imports than do countries with coastal access. With the exception of importing country airports, all of the transportation infrastructure variables are positively and significantly related to trade flows.

One interesting result in Table 3 is the negative coefficients on the variable measuring the difference in the two countries' polity scores. This result is similar to that in Mansfield, Milner,

and Rosendorff (2000), who found that pairs of democracies trade more than do mixed pairs of countries (democracy and autocracy). Democracies tend to trade more than autocracies on average, as indicated by the significant positive coefficient on the variable measuring the sum of the polity scores.

Oneal and Russett (1999) have argued that trade has the largest effect in reducing conflict among politically relevant dyads (defined as those including a major power or that are contiguous). Would the result in Table 2 that trade has only a small impact on cooperation change if only politically relevant dyads are examined? Tables 4 and 5 estimate the simultaneous equation model using only observations from politically relevant dyads. Table 4 shows that trade has no statistically significant impact on cooperation among politically relevant dyads, and the estimated effect of trade on overall cooperation between politically relevant dyads is less than half the effect of trade on cooperation between all dyads. The coefficient on the trade variable does become positive in the military cooperation regression in Table 4, but it is not significantly different from zero. Table 5 shows that cooperation continues to have a statistically significant impact on trade (though the magnitude of the effect declines) when only politically relevant dyads are examined. Thus, Tables 4 and 5 reinforce our earlier conclusion (similar to that of Keshk, Pollins, and Reuveny, 2004) that cooperation has a larger and more robust effect on trade than trade does on cooperation.

6. **CONCLUSION**

While there is a vast literature on the relationship between trade and military conflict, relatively little research has been done (particularly in recent years) on how trade is related to other forms of conflict between nations. This paper addresses this gap in the literature by

examining the relationship between trade and three different types of cooperation: political, military, and economic. There are several important conclusions that emerge. While increases in trade significantly raise cooperation between nations on political and economic issues, trade does not have the same significant positive impact on military cooperation. Thus, our results support the liberal paradigm that trade promotes political and economic cooperation between states but the results support the neorealist paradigm that trade does not further cooperation on military issues and may even spark military conflict.

There are four competing explanations for the result that trade does not inhibit military conflict. One explanation is that our results are due to the nature of the data, which contain mostly conflictual events on military issues, particularly since the media is more likely to report on such events. We believe, however, that our results are not due to the fact that military events tend to be mostly conflictual. A positive coefficient in this case should be interpreted as a move toward a less conflictual relationship while a negative coefficient indicates that military conflict between the countries grows worse on average as the explanatory variable increases.

A second plausible explanation for why trade does not significantly raise military cooperation can be due to the fact that some of the variation in military conflict across dyads is coming from lower levels of conflict. In other words, the liberal trade argument about peace applies to cases of violent military interstate disputes (often defined as wars) and not necessarily to lower levels of military conflict. In this case, our results are consistent with Kinsella and Russett (2002) who conclude that the effect of economic interdependence on lower levels of hostilities is not as strong as on the more severe form of military conflict. Our finding also is supported by Gartzke (2003) and Dorussen and Hegre (2003) who suggest that if military

conflict is expected to be limited and not result in war, then leaders are more likely accept risk and engage in low levels of conflict.

A third explanation is provided by the crisis and bargaining literature relating to the tendencies of states to escalate conflict as a form of communication or signaling. Strategic choice signaling theory suggests that it is possible for two states, even if they are democratic and economically interdependent, to engage in lower levels of conflict as a form of signaling or communication (Gartzke, Li, and Boemer 2001). Signaling theory, however, can explain only why economically interdependent states still engage in military conflict. It is not consistent with our result that more interdependent states are more politically and economically cooperative. It may be that signaling through military escalation is more credible than signaling through economic or political actions.

The last explanation for the different results on military conflict is that states perceive national security issues as a zero-sum game so that they value gains relative to foreign countries, as the neorealist paradigm suggests. Trade can provide absolute gains for nations but it cannot improve both countries' positions relative to the foreign trading partner. On the political and economic issues where states value absolute gains, however, trade can enhance cooperation between nations because it can improve both countries' positions simultaneously.

This paper provides strong evidence that, unlike the relatively small effect of trade on cooperation, cooperation has a large and statistically significant positive impact on trade. Thus, the negative relationship between trade and conflict found in much of the literature may have come from the fact that better cooperation leads to greater trade. In our model, both the effect of trade on cooperation and the effect of cooperation on trade are estimated simultaneously, so we

are able to identify the direction of causality. The results suggest that most of the positive relationship between trade and cooperation is being driven by the impact of cooperation on trade.

One novel result shown in this paper is that regional cooperation levels are estimated to have a significant influence on trade. A nation has larger trade flows if its neighboring countries have good political, military, and economic cooperation. One possible explanation for this result is that importers and exporters may view regional cooperation levels as a leading indicator of future conflict. They may be unwilling to invest in long-term trade contracts with nations who are more likely to be drawn into regional conflict, and thus poor regional cooperation dampens the trade of each country in the area relative to nations from more cooperative regions.

The results in this paper have implications for both researchers and policy makers. Scholars who examine the relationship between trade and military conflict may be capturing the smallest cooperative benefit from trade flows, since trade's impacts on political and economic cooperation are significantly positive but its effect on military cooperation is not. For policy makers, the foreign policy benefits of trade are likely to be concentrated, at least in the short run, on political and economic matters, so trade should not be seen as an immediate solution to all forms and levels of military conflict.

Table 1: Variable Definitions, Sources, and Means

Variable	Definition	Source	Mean
Cooperation	Goldstein bilateral conflict-cooperation measure based on all events reported	Virtual Research Associates Inc. (VRA)	0.651
Cooperation: political	Goldstein conflict-cooperation scale, political interaction events only	Virtual Research Associates Inc. (VRA)	0.782
Cooperation: military	Goldstein conflict-cooperation scale, military events only	Virtual Research Associates Inc. (VRA)	-0.198
Cooperation: economic	Goldstein conflict-cooperation scale, economic/market events only	Virtual Research Associates Inc. (VRA)	0.067
Trade_{ij}	Exports from source (i) to target country (j) in millions of 2000 dollars	IMF Direction of Trade Statistics	191.240
Regional Cooperation	Average cooperation score between country's 10 nearest neighbors	Calculated based on King and Lowe (2003)	1.370
GDP	Country gross domestic product in billions of 2000 dollars	Penn World Tables	254.740
GDPPC	Country per-capita gross domestic product in 2000 dollars	Penn World Tables	8,592.277
Distance	Kilometers between countries' most populous cities	CEPII database	7,446.290
Colony	=1 if pair of countries were ever involved in a colonial relationship	CEPII database	0.012
Common language	=1 if a language is spoken by at least 9% of the population in both countries	CEPII database	0.143
Contiguous	=1 if countries share a common land border	CEPII database	0.019
Railways	Km of railways per sq km of land area	CIA World Fact Book	0.020
Waterways	Km of inland waterways per sq km of land area	CIA World Fact Book	0.007
Highways	Km of highways per sq km of land area	CIA World Fact Book	0.566
Airports	Number of airports per sq km of land area	CIA World Fact Book	0.001
Landlocked	=1 if country has no coastline	CIA World Fact Book	0.203
$\text{Polity}_i + \text{Polity}_j$	Sum of country democracy ratings (-10 = autocratic, 10 = democratic)	Polity IV Project, www.cidcm.umd.edu/	5.467
$\lvert \text{Polity}_i - \text{Polity}_j \rvert$	Absolute value of difference between polity ratings	Polity IV Project, www.cidcm.umd.edu/	7.554
Shared IGOs	Number of IGOs in which both countries are full members during year	http://cow2.la.psu.edu/	29.339
Regional trade agreement	=1 if countries have a regional trade agreement with each other during year	www.wto.org	0.068
WTO	=1 if country is a member of the World Trade Organization	www.wto.org	0.724
Alliance	=1 if both countries in dyad belong to same alliance during year	COW database	0.076
Capability ratio	$= \ln\left(\frac{\text{higher capability index score}}{\text{lower capability index score}}\right)$	COW database	2.371
Major power	=1 if country is a major power	COW database	0.041

Table 2: Two-Stage Least Squares Estimates of the Effect of Trade on Dyad Cooperation Levels

Parameter	All events	Political	Military	Economic
$Ln(trade_{ij})$	0.1497 *	0.1332 *	-0.0355 *	0.0222 *
Regional $cooperation_i$	-0.0341 *	-0.0239	-0.0020	-0.0517 *
Regional $cooperation_j$	-0.0297 *	-0.0254	0.0441 *	-0.0394
$Ln(GDP_i)$	0.7242 *	0.8281 *	-0.1571 *	0.0854 *
$Ln(GDP_j)$	0.7588 *	0.8435 *	-0.1326 *	0.0712 *
$Ln(GDPPC_i)$	0.0926 *	0.0230	0.0838 *	0.0018
$Ln(GDPPC_j)$	0.0359	-0.0230	0.1160 *	-0.0302 *
Ln(distance)	-0.0149	-0.1484 *	0.0626	0.0209
Contiguous	1.0638 *	2.6557 *	-1.7291 *	0.1296 *
Common language	0.7422 *	0.9642 *	-0.2963 *	0.0918 *
Colony	3.3259 *	3.9517 *	-0.9030 *	0.3084 *
Regional trade agreement	-1.4259 *	-1.4113 *	0.1299	-0.1425 *
$Polity_i + Polity_j$	-0.0085 *	-0.0091 *	-0.0033	0.0010 *
$\lvert Polity_i - Polity_j \rvert$	-0.0199 *	-0.0025	-0.0185 *	0.0009
Shared IGOs	0.0395 *	0.0292 *	0.0097 *	0.0005
Alliance	2.8238 *	2.9458 *	-0.4494 *	0.3336 *
Capability ratio	-0.2088 *	-0.2179 *	0.0186 *	-0.0128 *
Year 1991	-0.4560	-0.2701	-0.1224	-0.0561
Year 1992	-0.2661	-0.3520 *	0.0628	-0.0438
Year 1993	-0.0179	-0.0162	-0.0205	-0.0451
Year 1994	0.5479 *	0.4556 *	0.0319	-0.0437
Year 1995	0.3376	0.2440	0.0474	-0.0319
Year 1996	0.3480	0.2731	0.0447	-0.0476
Year 1997	0.3891	0.2654	0.0482	-0.0167
Year 1998	0.0518	-0.0190	-0.0018	-0.0334
Year 1999	-0.1509	-0.2434	0.0183	-0.0319
Year 2000	-0.2139	-0.3001	0.0640	-0.0507
Year 2001	-0.5876 *	-0.5783 *	-0.0132	-0.0371
Year 2002	-0.9580 *	-0.9809 *	-0.0074	-0.0668
Year 2003	-1.2946 *	-1.3453 *	0.0878	-0.1407 *
Year 2004	-2.2484 *	-2.1604 *	0.0334	-0.2168 *
Constant	-6.7474 *	-4.9291 *	-1.3248 *	-0.4633 *
R^2	0.0543	0.0877	0.0080	0.0317
Observations	217,203	217,203	217,203	217,203
Wald statistic on instruments	163.21 *	161.50 *	26.04 *	47.32 *

Dependent variables = Goldstein (1992) conflict-cooperation scale from events data
- Column 1: dependent variable measured using all events
- Column 2: dependent variable measured using only political interactions
- Column 3: dependent variable measured using only military or violent interactions
- Column 4: dependent variable measured using only economic interactions

Source country = i
Target country =j

* indicates that the coefficient is statistically significant at the 1% level

Table 3: Two-Stage Least Squares Estimates of the Effect of Cooperation on Log Bilateral Trade

	All events	Political	Military	Economic
Cooperation	0.1221 *	0.1223 *	-0.0999	1.2631 *
Regional cooperation$_i$	0.0706 *	0.0550 *	0.0335 *	0.5899 *
Regional cooperation$_j$	0.0330 *	0.0552 *	-0.0221 *	0.5175 *
Ln(GDP_i)	0.9143 *	0.9073 *	1.0073 *	0.8866 *
Ln(GDP_j)	0.7510 *	0.7487 *	0.8569 *	0.7502 *
Ln($GDPPC_i$)	0.2733 *	0.2775 *	0.3491 *	0.3023 *
Ln($GDPPC_j$)	0.2170 *	0.1956 *	0.2507 *	0.2420 *
Ln(distance)	-1.0202 *	-0.9935 *	-1.0575 *	-1.0523 *
Contiguous	0.9527 *	0.8005 *	0.9691 *	0.9109 *
Common language	0.5273 *	0.5084 *	0.6955 *	0.4926 *
Colony	0.6565 *	0.5789 *	0.9738 *	0.6965 *
Regional trade agreement	0.5791 *	0.5888 *	0.5854 *	0.6250 *
$Polity_i + Polity_j$	0.0092 *	0.0117 *	0.0094 *	0.0089 *
$\| Polity_i - Polity_j \|$	-0.0012	-0.0039 *	-0.0100 *	-0.0047 *
$Railways_i$	3.9295 *	4.7862 *	4.2939 *	4.4804 *
$Railways_j$	4.4263 *	4.5032 *	4.3701 *	4.0179 *
$Highways_i$	0.1310 *	0.1306 *	0.2062 *	0.0732 *
$Highways_j$	0.2406 *	0.2132 *	0.2638 *	0.2733 *
$Airports_i$	44.8608 *	41.1298 *	28.0455 *	59.6707 *
$Airports_j$	-2.5589	5.5462	0.3074	-3.6627
$Waterways_i$	3.7315 *	4.2463 *	4.2552 *	6.4036 *
$Waterways_j$	2.0041 *	1.9712 *	2.2168 *	1.7914 *
$Landlocked_i$	-0.3458 *	-0.3322 *	-0.3600 *	-0.3724 *
$Landlocked_j$	-0.5383 *	-0.5053 *	-0.5156 *	-0.5140 *
WTO_i	0.3398 *	0.3793 *	0.2609 *	0.3816 *
WTO_j	0.1329 *	0.2003 *	0.1398 *	0.1724 *
Year 1991	0.1228 *	0.1042 *	-0.0102	0.1090
Year 1992	0.1234 *	0.2125 *	0.1021 *	0.1691 *
Year 1993	-0.1180 *	-0.0611	-0.0965 *	0.0011
Year 1994	-0.3945 *	-0.3056 *	-0.2516 *	-0.1269 *
Year 1995	-0.3153 *	-0.2362 *	-0.2175 *	-0.1698 *
Year 1996	-0.3775 *	-0.3023 *	-0.3153 *	-0.1921 *
Year 1997	-0.5116 *	-0.4218 *	-0.3888 *	-0.3480 *
Year 1998	-0.5023 *	-0.4100 *	-0.4587 *	-0.2978 *
Year 1999	-0.6416 *	-0.5399 *	-0.6121 *	-0.5498 *
Year 2000	-0.7064 *	-0.6420 *	-0.7269 *	-0.6060 *
Year 2001	-0.6800 *	-0.6541 *	-0.8286 *	-0.7016 *
Year 2002	-0.6406 *	-0.5404 *	-0.8363 *	-0.7144 *
Year 2003	-0.5609 *	-0.4540 *	-0.8242 *	-0.5443 *
Year 2004	-0.1424 *	-0.0574	-0.5859 *	-0.0772
Constant	-2.4960 *	-2.8250 *	-3.5800 *	-2.7140 *
R^2	0.5252	0.5692	0.6268	0.4109
Observations	217,203	217,203	217,203	217,203
Wald statistic on instruments	664.32 *	675.33 *	854.20 *	775.73 *

* indicates that the coefficient is statistically significant at the 1% level

Table 4: 2SLS Estimates of the Effect of Trade on Cooperation, Politically Relevant Dyads Only

Parameter	All events	Political	Military	Economic
$Ln(trade_{ij})$	0.0631	-0.0242	0.0647	0.0396
Regional $cooperation_i$	-0.2249	-0.2598 *	-0.0600	-0.2905
Regional $cooperation_j$	-0.2033	-0.2311	0.6372 *	-0.2381
$Ln(GDP_i)$	3.4528 *	3.8476 *	-0.8230 *	0.4164 *
$Ln(GDP_j)$	3.5933 *	3.9281 *	-0.8460 *	0.4110 *
$Ln(GDPPC_i)$	0.5872	0.4062	0.3552	0.0067
$Ln(GDPPC_j)$	0.0658	-0.1190	0.6921 *	-0.2469 *
Ln(distance)	0.0116	-0.5771	0.5556 *	0.0072
Contiguous	3.8429 *	4.6645 *	-1.4047 *	0.4290 *
Common language	4.2375 *	5.3426 *	-1.7485 *	0.5315 *
Colony	2.3963 *	2.7607 *	-0.2851	0.0893
Regional trade agreement	-4.9753 *	-4.4970 *	0.0302	-0.3922 *
$Polity_i + Polity_j$	0.0252	0.0285	-0.0566 *	0.0198 *
$\| Polity_i - Polity_j \|$	-0.1355 *	-0.0174	-0.1215 *	0.0047
Shared IGOs	0.0481 *	0.0036	0.0470 *	-0.0106 *
Alliance	9.0645 *	9.1861 *	-1.2853 *	1.0846 *
Capability ratio	-0.9644 *	-1.1624 *	0.1731	-0.0848 *
Year 1991	-3.8349	-2.1495	-1.0205	-0.5633
Year 1992	-1.5256	-3.1648	1.9600	-0.7683
Year 1993	0.0317	-1.2020	1.6709	-0.7997
Year 1994	2.2860	0.6318	1.9498	-0.8615
Year 1995	0.8963	-0.7904	2.0618	-0.7615
Year 1996	1.3180	-0.1270	2.0405	-0.8593
Year 1997	2.2945	0.2563	2.1337	-0.6027
Year 1998	0.5880	-1.0353	1.6717	-0.6850
Year 1999	-0.5868	-2.3008	1.8778	-0.6804
Year 2000	-0.7805	-2.6640	2.3464	-0.8489
Year 2001	-3.0955	-4.2531	1.6121	-0.7939
Year 2002	-5.0939	-6.4183 *	1.6255	-0.9228
Year 2003	-6.3860	-8.1202 *	2.2106	-1.3327 *
Year 2004	-10.4066 *	-11.7539 *	2.0398	-1.6267 *
Constant	-36.5146 *	-28.2314 *	-8.2640 *	-0.7821
R^2	0.1155	0.1757	0.0171	0.0799
Observations	29,051	29,051	29,051	29,051
Wald statistic on instruments	55.36 *	70.16 *	18.90 *	34.11 *

Dependent variables = Goldstein (1992) conflict-cooperation scale from events data
- Column 1: dependent variable measured using all events
- Column 2: dependent variable measured using only political interactions
- Column 3: dependent variable measured using only military or violent interactions
- Column 4: dependent variable measured using only economic interactions

Source country = i
Target country =j

* indicates that the coefficient is statistically significant at the 1% level

Table 5: 2SLS Estimates of the Effect of Cooperation on Trade, Politically Relevant Dyads Only

	All events	Political	Military	Economic
Cooperation	0.0572 *	0.0570 *	-0.0418	0.3031 *
Regional cooperation$_i$	0.0743 *	0.0576 *	0.0436 *	0.5235 *
Regional cooperation$_j$	-0.0080	0.0121	-0.0141	-0.0033
Ln(GDP_i)	0.6982 *	0.6899 *	0.9070 *	0.7890 *
Ln(GDP_j)	0.5294 *	0.5214 *	0.7665 *	0.6425 *
Ln($GDPPC_i$)	0.2827 *	0.2960 *	0.3452 *	0.3296 *
Ln($GDPPC_j$)	0.3142 *	0.3281 *	0.3299 *	0.3627 *
Ln(distance)	-0.5692 *	-0.5455 *	-0.6612 *	-0.6297 *
Contiguous	1.0208 *	0.9610 *	1.3009 *	1.1978 *
Common language	0.3265 *	0.2575 *	0.5102 *	0.4080 *
Colony	0.6944 *	0.6762 *	0.8627 *	0.8139 *
Regional trade agreement	0.5386 *	0.5126 *	0.4115 *	0.4772 *
$Polity_i + Polity_j$	-0.0107 *	-0.0110 *	-0.0132 *	-0.0144 *
$\| Polity_i - Polity_j \|$	0.0027	-0.0059	-0.0180 *	-0.0110 *
$Railways_i$	2.9578 *	3.6941 *	2.8547 *	3.3746 *
$Railways_j$	6.9595 *	6.0382 *	4.3928 *	5.5567 *
$Highways_i$	0.0679 *	0.0688 *	0.1502 *	0.0406
$Highways_j$	0.1081 *	0.0785 *	0.0945 *	0.1293 *
$Airports_i$	20.8158	15.6903	24.0317	41.3278 *
$Airports_j$	53.6951 *	63.0433 *	93.3056 *	75.2147 *
$Waterways_i$	1.6549	3.2763 *	3.1034 *	5.2159 *
$Waterways_j$	2.2559 *	3.0040 *	1.5441	1.4804
$Landlocked_i$	-0.4577 *	-0.4123 *	-0.4390 *	-0.4949 *
$Landlocked_j$	-0.3184 *	-0.2299 *	-0.2121 *	-0.2282 *
WTO_i	0.4415 *	0.4521 *	0.4121 *	0.4633 *
WTO_j	0.4995 *	0.6087 *	0.6873 *	0.5723 *
Year 1991	0.2116	0.1240	-0.0692	0.1595
Year 1992	0.2240	0.3539	0.2191	0.3650
Year 1993	-0.0103	0.0920	0.0779	0.2624
Year 1994	-0.3278	-0.2017	-0.1332	0.1174
Year 1995	-0.1498	-0.0208	-0.0357	0.1365
Year 1996	-0.2457	-0.1381	-0.1221	0.1035
Year 1997	-0.3924	-0.2343	-0.1604	-0.0373
Year 1998	-0.3199	-0.1896	-0.2247	-0.0011
Year 1999	-0.3952	-0.2574	-0.3634 *	-0.2124
Year 2000	-0.4089	-0.2744	-0.3905 *	-0.1663
Year 2001	-0.3384	-0.2591	-0.5333 *	-0.2888
Year 2002	-0.2367	-0.1340	-0.5577 *	-0.3091
Year 2003	-0.0722	0.0537	-0.4641 *	-0.0619
Year 2004	0.3789	0.4775 *	-0.2762	0.2584
Constant	-4.6763 *	-5.2377 *	-6.5997 *	-6.1500 *
R^2	0.4644	0.5648	0.6634	0.5934
Observations	29,051	29,051	29,051	29,051
Wald statistic on instruments	115.83 *	116.62 *	121.67 *	120.03 *

* indicates that the coefficient is statistically significant at the 1% level

Appendix 1: Categories of Dyadic Events

Political events			**Military Events**		
Goldstein	IDEA	Definition	Goldstein	IDEA	Definition
7.6	074	rally support	8.3	072	extend military aid
7.6	073	extend humanitarian aid	5.2	0522	promise military support
6.5	081	make substantial agreement	3	0821	agree to peacekeeping
6.5	0824	agree to settlement	2.9	0656	de-mining
5.4	064	improve relations	2.9	0658	ease military blockade
5.2	0523	promise humanitarian support	2.2	0654	demobilize armed forces
4.8	083	collaborate	2.2	0651	observe truce
4.8	08	agree	1.6	0932	ask for military aid
4.7	05	promise	-5.6	1933	reduce military assistance
4.5	051	promise policy support	-5.6	1934	reduce peacekeeping forces
3.5	0432	forgive	-6.8	2112	guerrilla seizure
3.5	04	endorse or approve	-6.8	2111	police seizure
3.4	092	solicit support	-6.8	21	seize
3.4	043	empathize	-6.9	226	control crowds
3.4	041	praise	-7	2231	military clash
3	082	agree or accept	-7	1736	threaten biological attack
3	0823	agree to negotiate	-7	1735	threaten nuclear war
3	0822	agree to mediate	-7	1734	threaten military war
2.8	054	assure	-7	1733	threaten military occupation
2.8	033	host meeting	-7	1732	threaten military blockade
2.5	062	extend invitation	-7	1731	threaten military attack
2.2	0655	relax curfew	-7	173	military force threat
2.2	0652	relax censorship	-7	198	declare war
2.2	0632	evacuate victims	-7.6	1827	military border violation
2.2	063	provide shelter	-7.6	1826	military border fortification
2.2	06	grant	-7.6	1825	military mobilization
2.2	0431	apologize	-7.6	1824	military troops display
2	026	acknowledge responsibility	-7.6	1823	military naval display
1.9	066	release or return	-7.6	1822	border fortification
1.9	0662	return, release property	-7.6	1821	military alert
1.9	0661	return, release persons	-7.6	182	military demonstration
1.9	032	travel to meet	-8.7	221	bombings
1.8	044	apologize	-8.7	2238	vehicle bombing
1.6	0933	ask for humanitarian aid	-9.2	2236	military seizure
1.6	09	request	-9.2	213	abduction
1.5	1011	offer peace proposal	-9.2	2132	abduction
1.5	101	peace proposal	-9.2	211	seize possession
1.5	03	consult	-9.6	2228	assassination
1.5	104	offer to mediate	-9.6	2227	guerrilla assault
1.5	103	offer to negotiate	-9.6	2226	paramilitary assault
1.2	094	call for action	-9.6	2225	torture
1.1	01	yield	-9.6	2224	sexual assault
1	031	discussions	-9.6	2223	bodily punishment
1	0312	engage in negotiation	-9.6	2222	shooting
1	0311	mediate talks	-9.6	2221	beatings
0.8	10	propose	-9.6	222	physical assault
0.6	011	yield to order	-9.6	22	force
0.1	091	ask for information	-10	2239	missile attack
0.1	024	optimistic comment	-10	2237	biological weapons use

-0.1	095	ask for protection	-10	2235	assault
-0.1	022	pessimistic comment	-10	2234	military occupation
-0.1	021	decline comment	-10	2233	coups and mutinies
-0.1	02	comment	-10	2232	military raid
-0.9	141	deny responsibility	-10	223	military engagements
-1	14	deny	-10	225	unconventional weapon attack
-1.1	0631	grant asylum	-10	2251	chemical-biological attack
-2.2	192	reduce routine activity			
-2.2	121	criticize or blame			
-2.4	132	formally complain			
-2.4	131	informally complain	**Economic events**		
-2.4	13	complain	7.4	071	extend economic aid
-2.8	12	accuse	5.2	0521	promise economic support
-3	161	warn	5.2	052	promise material support
-3	16	warn	3.4	093	ask for material aid
-3.4	122	denounce or denigrate	2.9	065	ease sanctions
-3.8	194	halt negotiations	2.2	0653	relax administrative sanction
-3.8	1941	halt negotiations	1.6	0931	ask for economic aid
-3.8	1942	halt mediation	0.6	012	yield position
-4	1134	break law	-4.5	1963	administrative sanctions
-4	1132	disclose information	-4.5	1961	strike
-4	1131	political flight	-4.5	196	strikes and boycotts
-4	113	defy norms	-4.5	19	sanction
-4	1123	veto	-5.6	193	reduce or stop aid
-4	1122	censor media	-5.8	172	sanctions threat
-4	1121	impose curfew			
-4	112	refuse to allow			
-4	111	reject proposal			
-4	11	reject			
-4.4	2122	political arrest and detention			
-4.4	2121	criminal arrest and detention			
-4.4	212	arrest and detention			
-4.4	171	nonspecific threats			
-4.9	151	demand			
-4.9	15	demand			
-5	201	expel			
-5	20	expel			
-5.2	1813	protest defacement and art			
-5.2	1812	protest procession			
-5.2	1811	protest obstruction			
-5.2	181	protest demonstrations			
-5.6	1932	reduce humanitarian assistance			
-5.8	1721	threaten to halt negotiations			
-5.8	1722	threaten to halt mediation			
-5.8	1725	threaten to reduce or break relations			
-6.4	175	nonmilitary force threats			
-6.4	17	threaten			
-6.9	1814	protest altruism			
-6.9	18	protest			
-6.9	174	give ultimatum			
-7	195	break relations			
-8.3	224	riot or political turmoil			

Endnotes

[1] Speech by U.S. Trade Representative Charlene Barshefsky to the National Press Club in Washington, October 19, 2000, http://canberra.usembassy.gov/hyper/2000/1019/epf406.htm.

[2] Remarks by Jendayi Frazer, Assistant Secretary for African Affairs, January 10, 2006, http://www.state.gov/p/af/rls/rm/2006/60383.htm.

[3] Useful reviews of the literature on the relationship between trade and conflict include the volumes by Mansfield and Pollins (2003) and Schneider, Barbieri and Gleditsch (2003).

[4] Political and economic events have been included as part of overall cooperation measures in earlier papers using events data. By creating an overall cooperation variable, however, the studies have implicitly assumed that trade has an identical impact on political, military, and economic cooperation. We test that assumption here.

[5] Empirically, there are also some unresolved issues relating to conceptualization, measurement and statistical methods (Barbieri 2003; Barbieri and Schneider 1999).

[6] Using non-cooperative games, the relative gains concerns of realists were addressed by Powell (1991) and Morrow (1997), showing that it is possible for enemies to engage in economic exchange. Morrow (1997) shows that concern about relative gains is not likely to impede trade between rivals.

[7] Of course, events data are not without their own problems. There are difficulties in placing each news report into a preset category and identifying duplicate reports about the same event, and there is a tendency for some events (and nations) to be reported on more often than other events.

[8] See (http://www.vranet.com).

[9] The two authors separately coded the IDEA codes for events into one of three categories: political, military, and economic. There were only three cases in which the authors had different category codes for the same event, and these minor disagreements were resolved after further discussion.

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